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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,824	07/24/2001	Hiroshi Tobimatsu	50090-306	3928

7590 10/10/2003

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EXAMINER

LEE, HSIEN MING

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 10/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action	Application No. 09/910,824	Applicant(s) TOBIMATSU ET AL.	
	Examiner Hsien-Ming Lee	Art Unit 2823	

--Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 16 September 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
- b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) ☐ they raise the issue of new matter (see Note below);
 - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____

3. ☒ Applicant's reply has overcome the following ^{objection} rejection(s): objection to claim 1.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: see separate sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____

Claim(s) objected to: _____

Claim(s) rejected: 1-4 and 6

Claim(s) withdrawn from consideration: _____

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
10. ☐ Other: _____

Response to the arguments

1. The amendment after Final has overcome the objection to claim 1.
2. The arguments have been fully considered but do not place the application in condition for allowance for the reasons as follow.

Firstly, applicants argue that “Examiner does not factually established requisite inherency” as to the **removal of the surface** of the polyimide film (second paragraph of page 5).

In response to the argument, Shinohara teaches ashing the surface of the substrate 11 by oxygen plasma (Fig. 2F and col. 3, lines 20-21), wherein the substrate 11 is a portion of a **laminated** structure 11/12/14/15/16 as shown in Fig. 2G. By ashing the substrate 11, the portion of the upper surface of the polyimide film 16 have also been removed. This is not only because the substrate 11 and the polyimide film 16 are **simultaneously** exposed to the ashing ambient but also because oxygen plasma is a known etchant for etching semiconductor substrate and polyimide.

Secondly, applicants argue that “neither Shinohara or Sakurai discloses or suggests that the amount of polyimide removed during oxygen ashing is an art-recognized results effective variable.” (third paragraph, page 5)

In response to the argument, one of the ordinary skilled would have been motivated to remove the desired amount of polyimide from the surface of the polyimide film because the removed amount is relevant to the thickness of the hardened layer that is formed on the surface of the polyimide film. The hardened layer is a residue resulting from ashing and is harmful to the device. If the hardened layer is formed to a thickness of 2 micrometer, then one of the ordinary skilled in the art would have been motivated to remove a thickness of 2 micrometer

from the surface of the polyimide film, i.e. it is a routine experimentation with optimum process. In such a situation, the applicant must show that the particular range is **critical**, generally by showing that the claimed range achieves **unexpected** results. See M.P.E.P. 2144.05 III. In fact, the originally filed specification merely states that “ the surface of the polyimide film 4 is removed by a predetermined thickness of , e.g. 0.1 μm to several micrometers.” It does **not** even suggest how the removed amount would achieve **unexpected** results as relative to the prior art.

In this regard, applicants assert that “ [t]here is no requirement upon Applicants to demonstrate criticality, or even present an argument, until such time as the Examiner establishes a prima facie basis to deny patentability to the claimed invention.” (last paragraph, page 6).

Contrary to the arguments, a prima facie basis **has been established** by the Examiner, as stated in the Final rejection on page 5. Without the demonstration of criticality, the claimed invention is **not patentably distinct** from the prior art.

Thirdly, applicants also argue that Shinohara does not teach the formation of a hardened polyimide layer (first paragraph, page 5); Fu et al. neither disclose nor suggest the formation of a hardened film on a photosensitive polyimide layer; and the Examiner hops, skips and jumps among the references to arrive the claimed invention. (first paragraph, page 6)

In response to the arguments, Shinohara teaches using fluorine-based gas mixture to etch the passivation film 15 to form an opening 17 (Fig. 2F and col. 3, lines 17-20), in which the overlying photosensitive polyimide film 16 is apparently also exposed to the fluorine-based gas mixture. Shinohara is silent as to the formation of a hardened layer on the surface of the photosensitive polyimide film 16 resulting from the etching. To remedy this deficiency, Sakura reference is used. Sakura teaches using the **same** etchant (i.e. fluoric system, which is equivalent

to the fluorine-based gas mixture of Shinohara) to etch the **same** material 203 (i.e. silicon nitride) to form **same** feature 209 (i.e. opening) while the photoresist layer 205 is simultaneously exposed to the **same** etchant (Fig. 2H and col. 2, lines 24-25). Sakura further suggests that, as a result of the etching, a hardened layer is formed on the surface of the photoresist layer 205 (col. 2, lines 41-44).

The issue is that whether the photoresist layer 205 of Sakura is equivalent to the photosensitive polyimide layer 16 of Shinohara. If it is, then the hardened layer would form on the surface of the photosensitive layer 16 of Shinohara because similar process can reasonably be expected to yield product, which inherently have the same properties. *In re Spada* 15 USPQ2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 1950).

To support the position that the photoresist layer 205 of Sakura is equivalent to the photosensitive polyimide layer 16 of Shinohara, Fu reference is used. Fu et al. teach that photoresist layer has been known as the photosensitive polyimide layer (col. 5, lines 39-40).

Therefore, with the support of teachings of Sakura and Fu et al., one of the ordinary skill in the art would have recognized that the hardened layer is **consequently formed** on the surface of photosensitive polyimide film 16 of Shinohara during etching the passivation film 15 although Shinohara is silent to it. The aforementioned reasoning appears to be very systematic and logical, not hopping, skipping and jumping among the references to arrive the claimed invention.

Lastly, applicants argue that “Shinohara address a different problem from that addressed by the claimed invention’ because Shinohara concerns about poor adhesion of the polyimide to

the mold resin, whereas the claimed invention is concerned with dimensional accuracy. (second paragraph, page 7)

In response the arguments, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Ohiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

For the reasons above, the Final rejection is deemed proper.

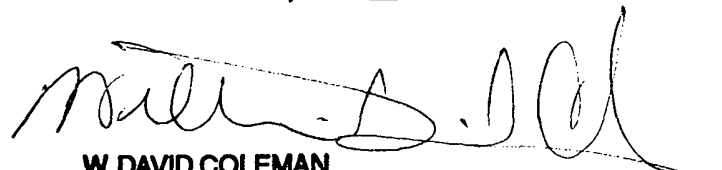
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 703-305-7341. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hsien-Ming Lee
Examiner
Art Unit 2823

Oct.3, 2003

Lee

W. DAVID COLEMAN
PRIMARY EXAMINER